



## Cleaning of Acrylic Painted Surfaces

July 12 – 15, 2016

The John and Mable Ringling Museum of Art  
Sarasota, Florida

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**SESSION TITLE:** pH Adjusted Water Recipes

**INSTRUCTOR:** Chris Stavroudis

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### TECHNICAL NOTE

The following pH adjusted aqueous rinse solutions are made with acetic acid and ammonium hydroxide because both the acid and base components are volatile and will leave no residue on the paint surface. By setting the pH and the ionic strength (conductivity) we have controlled the intrinsic properties of the water.

These recipes allow you to prepare the rinsing solutions at their listed pH and with the stated conductivity. Absent a conductivity meter, diluting the solution to the stated final volume will yield a solution sufficiently close to the stated conductivity. All that is required is a pH meter to set the solution to the appropriate pH. Glacial acetic acid is pure (100%) acetic acid. (It's called glacial because on a cold morning in an unheated lab it will begin to freeze and form large chunks of solid acetic acid floating in the remaining liquid.)

6,000 $\mu$ S/cm

pH 5.0

1mL Glacial Acetic Acid in 100 mL distilled or deionized water  
Set pH to 5.0 with 10% Ammonium Hydroxide (approximately 8mL)  
Dilute to a final conductivity of 6,000 $\mu$ S or  
Dilute to 125 mL final volume if you don't have a conductivity meter.

pH 5.5

1mL Glacial Acetic Acid in 100 mL distilled or deionized water  
Set pH to 5.5 with 10% Ammonium Hydroxide (approximately 10mL)  
Dilute to a final conductivity of 6,000 $\mu$ S or  
Dilute to 160 mL final volume if you don't have a conductivity meter

pH 6.0

1mL Glacial Acetic Acid in 100 mL distilled or deionized water  
Set pH to 6.0 with 10% Ammonium Hydroxide (approximately 11 mL)  
Dilute to a final conductivity of 6,000 $\mu$ S or  
Dilute to 170 mL final volume if you don't have a conductivity meter

pH 6.5

1mL Glacial Acetic Acid in 100 mL distilled or deionized water  
Set pH to 6.5 with 10% Ammonium Hydroxide (approximately 12mL)  
Dilute to a final conductivity of 6,000 $\mu$ S or  
Dilute to 175mL final volume if you don't have a conductivity meter



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## Technical Note cont'd.

The pKa of acetic acid is 4.756 and the pKa of ammonium hydroxide is 9.25 thus the pH 5.0 and 5.5 solutions will be buffered by the acetic acid/acetate ion equilibrium. The other solutions will be pH adjusted but will have no intrinsic buffering capacity.



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